

Water Quality and Quantity

Streams, wetlands and tidal rivers of the Delaware Bay and Estuary Basin support diverse populations of fish and wildlife and provide public drinking water supplies, agricultural and industrial needs. **Ground water** is the only source of public water supply located within the basin; however, many residents are served by public water suppliers that use **surface water** sources from the neighboring Piedmont Basin. Agricultural water users also rely on the basin's ground water, with the exception of a small number of farm ponds and streams used for withdrawals. Industrial water use is heavier than in any other basin and is almost exclusively drawn from ground-water sources and the Delaware River.

The five most heavily used **aquifers** in the Delaware Basin are the Columbia, Potomac, Cheswold, Frederica, and Piney Point. The Columbia and Potomac supply over 40 million gallons of water on a daily basis. The remainder of the withdrawals comes from the Cheswold, Frederica, Piney Point

and other aquifers within the basin. Of the five major aquifers, only the Columbia, Cheswold, and Frederica have adequate supplies to allow for further allocations. The declines in water levels in the Potomac and Piney Point, compared to their historical levels, are currently too great to allow additional large-water allocations.

These restrictions impact two of the three highest growth areas of the state – greater Dover and New Castle County. While water levels in the Piney Point have stabilized over the past several years, those in the Potomac have not and continue to show gradual decline, approaching the top of the aquifer in northern New Castle County. Due to the heavy use of the aquifer in that area, along with proposals for additional withdrawals, the Department is constructing a regional ground-water flow model under contract with the U.S. Army Corps of Engineers to determine the maximum yield from the aquifer. Once completed, the model will enable the Department to make decisions regarding exist-

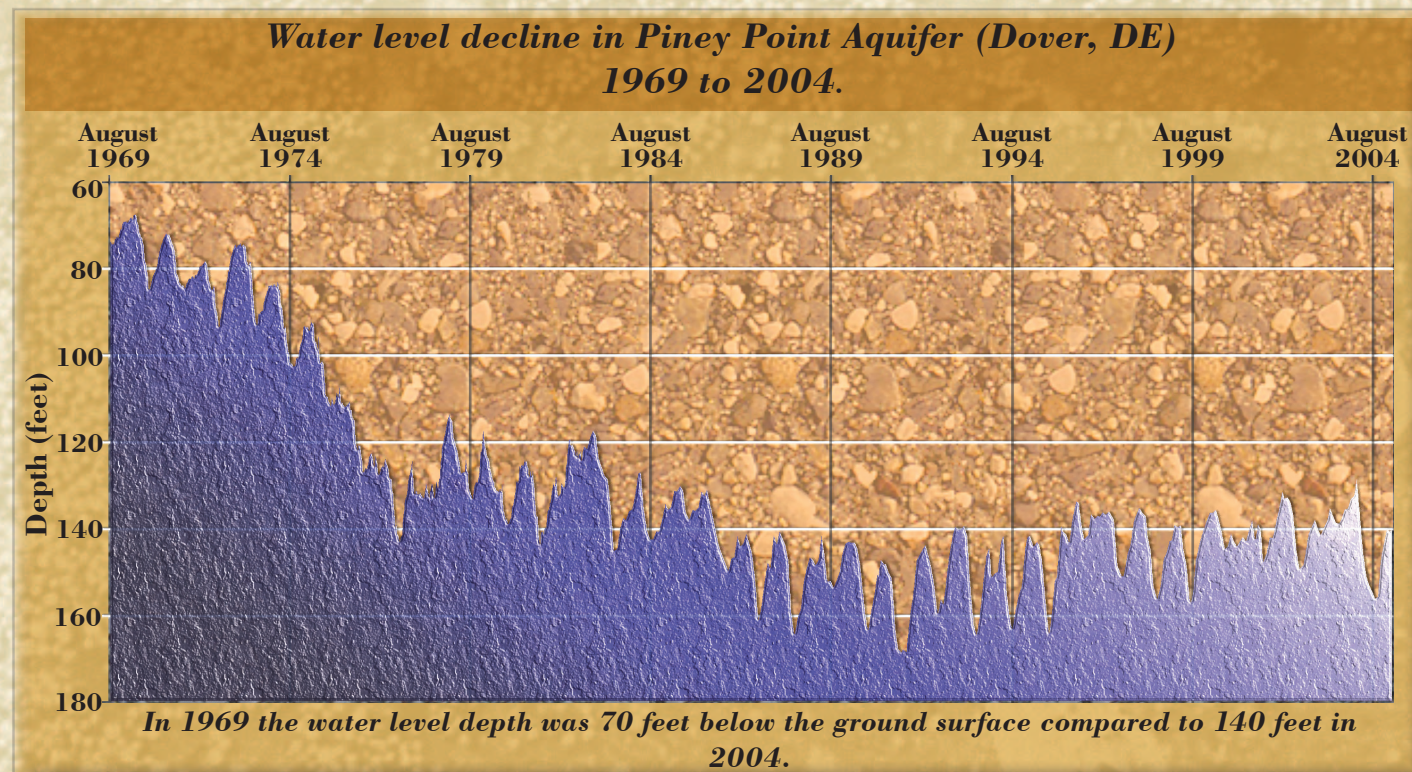


Photo by NOAA

ing allocations for the aquifer, and the possibility of any additional withdrawals. Further growth in these areas will require development of new water supplies and the integration of water supplies on a regional basis connecting water sources in less-stressed areas with populations in high-growth areas.

Regarding water quality, the Delaware River in the Philadelphia area was once one of the most polluted estuarine regions nationwide. Low levels of dissolved oxygen – a primary sign of poor water quality – were a chronic condition in warm weather. Today, water quality has vastly improved due to advances in wastewater treatment systems and regional bay monitoring. Dissolved oxygen levels in the estuary have returned to moderate levels that will now sustain fish populations. The Delaware Bay coastline has been largely preserved and the fresh water and estuarine habitats have remained environmentally productive due to enactment of the Coastal Zone Act in 1971. The headwaters and upland sections of the streams that discharge to the bay in the **coastal zone**, however, are susceptible to contamination from agricultural, urban, septic and industrial sources.

The maximum pollution limit that streams can tolerate and meet water quality standards is called the **total maximum**

daily load (TMDL). The Department is currently establishing TMDLs for impaired waterways and works with citizens, environmentalists, local officials and other groups to develop pollution reduction strategies and restore water quality. The Appoquinimink watershed's level of stream contamination has caused it to be one of the first watersheds subject to TMDL restrictions. TMDLs have also been set for **nutrients** and **dissolved oxygen** in the Murderkill River and its tributaries. **Pollution control strategies** are being developed which, when implemented, will help meet those limits.

Contamination of the shallow aquifers – the Columbia, for example – is also a concern because of the basin's high industrial concentration. The detection of **BCEE (bis[2-chloroethyl] ether)** – a known carcinogen – in the Llangollen wellfield (Potomac aquifer) required its removal through water treatment at great expense and led to a statewide investigation of surface and ground-water public drinking water supplies located near **hazardous waste** sites, nearly half of them in this basin. Fortunately, results indicated that none of the treated water supplies in the study exceeded existing regulatory standards for drinking water.

Salt-water intrusion can also affect the basin's aquifers. Normally, salt water does not impact a large area in any of Delaware's aquifers. However, wells pumping from the fresh water portion of the aquifers lower the water level, causing the salt water to move further inland. This has mainly occurred in coastal New Castle and coastal Sussex counties.

